



**MICHIGAN DEPARTMENT OF TRANSPORTATION**

**State Long-Range Transportation Plan  
2005-2030**

# **Environmental Technical Report**

*Prepared by  
The Michigan Department  
of Transportation  
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*With assistance from*



**Wilbur Smith Associates**

**MI Transportation**

MICHIGAN LONG RANGE TRANSPORTATION PLAN

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## Executive Summary

The Michigan Department of Transportation (MDOT) is faced with an array of environmental laws and regulations that touch every aspect of operation. It is a continual challenge to develop a transportation system that is efficient, safe, and responsive to the needs of the user while being compliant with all environmental regulations and sensitive to the preservation of natural and cultural resources. This report identifies existing sensitive environmental resources in the state; how these resources may be impacted by transportation investments; what current environmental policies, procedures, and strategies at the state and federal level affect the planning, design and construction of transportation systems; and, how an integrated approach entails safeguarding the state's natural resources by managing the trade-offs between valuable activities and access to those activities regardless of travel mode.

## Chapter 1. Introduction

This report is one of several technical reports being prepared as part of the 2005-2030 Michigan Department of Transportation (MDOT) State Long-Range Transportation Plan (*MI Transportation Plan*) process. In developing a vision for Michigan's transportation system over the next 25 years, it is important to have an understanding of key sensitive environmental resources, from a statewide perspective, that may be impacted by transportation facilities and programs. Transportation systems have the potential to negatively affect the natural environment by physically altering existing conditions (i.e., drainage courses and wildlife corridors) or by the consequence of use of its products (i.e., vehicle emissions). The purposes of this report are: (1) describe existing conditions, trends, and implications of key statewide environmental and historic resources relative to the transportation system in Michigan; (2) review current environmental policies and procedures affecting transportation projects; (3) identify environmental goals, objectives, and strategies of the 2000-2025 *Michigan State-Long Range Transportation Plan - Mobility is Security*, and how recent public input for *MI Transportation Plan* compares to the current plan; (4) describe environmental policies and strategies that the Federal Highway Administration (FHWA), the Federal Aviation Administration (FAA), the Federal Rail Administration (FRA), and the Federal Transit Administration (FTA) are employing to protect and preserve the natural environment when implementing transportation improvements; and (5) discuss how this environmental report is integrated into the development of *MI Transportation Plan*.

## Chapter 2. Key Environmental Resources: Characteristics Trends, and Implications

### 2.1 Forests, Parks, Recreation Areas, and Wildlife Refuges

Michigan is geographically unique, as it is divided into two peninsulas and is adjacent to four of the five Great Lakes, the largest fresh water source in the world. When Michigan was initially settled by Europeans in the 1830s, approximately 90 percent of the state was covered with forests. Today, forests cover about 53 percent of the state. Much of the reduction in forestland occurred during the 1800s and early 1900s when the timber industry was a major part of Michigan's economy. **Figure 1** shows the location of forestland in Michigan. It is apparent that a higher occurrence of forestland is in the Upper Peninsula and in the northern half of the Lower Peninsula. State and federal parkland and wildlife areas are distributed throughout Michigan, as shown in **Figure 2**. MDOT works closely with the United States Forest Service (USFS) and the National Park Service in the environmental review of transportation projects that may affect federal resources.

One implication for future transportation is providing effective, low-impact access to these resources. Outdoor recreation plays an important role in the tourism industry in Michigan with activities typically occurring on state and federal parks and recreation areas. As this industry continues its popularity, new means of transportation access to the resources that support this industry may be necessary. This may cause more frequent impacts to lands involving parks, recreation, and wildlife areas, and land acquired or improved with land and water conservation funds, resulting in project delays and cost increases for transportation improvements and mitigation requirements. These impacts may be offset with innovative transportation strategies to move people in and out of heavy use areas such as using rail, bus, and water-borne transport.



Figure 1: Forests

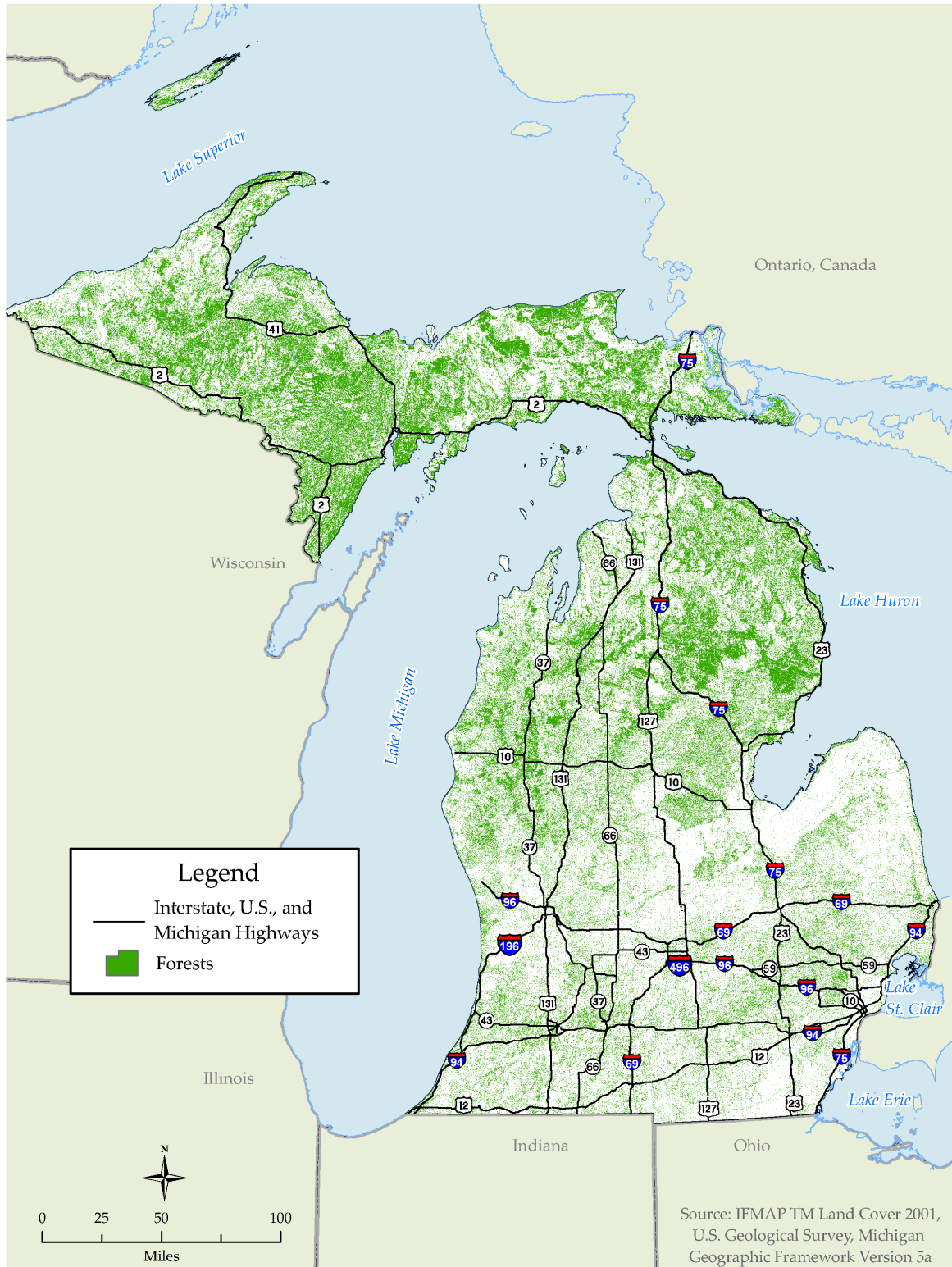
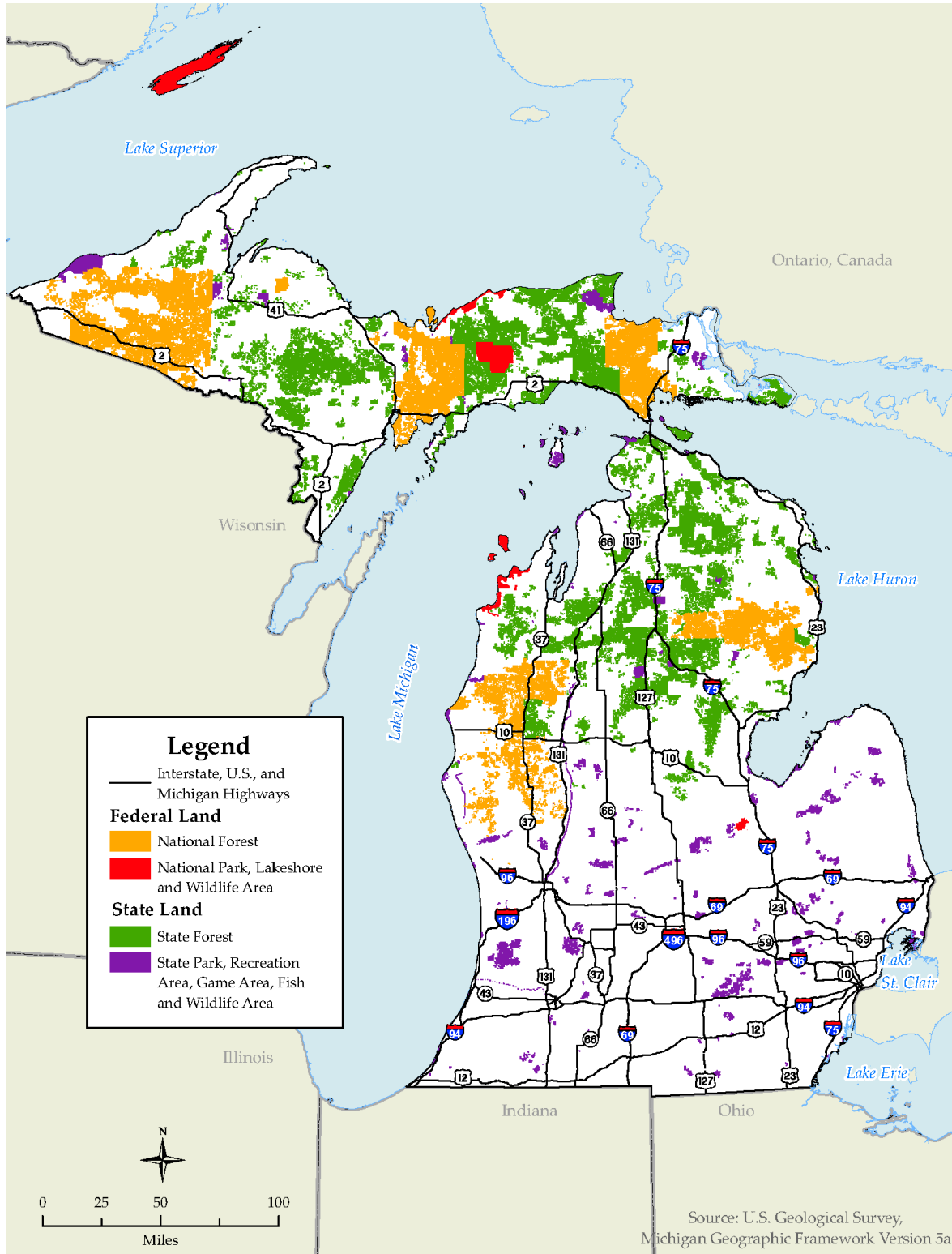


Figure 2: State and Federal Parkland and Wildlife Areas





## 2.2 Water Resources

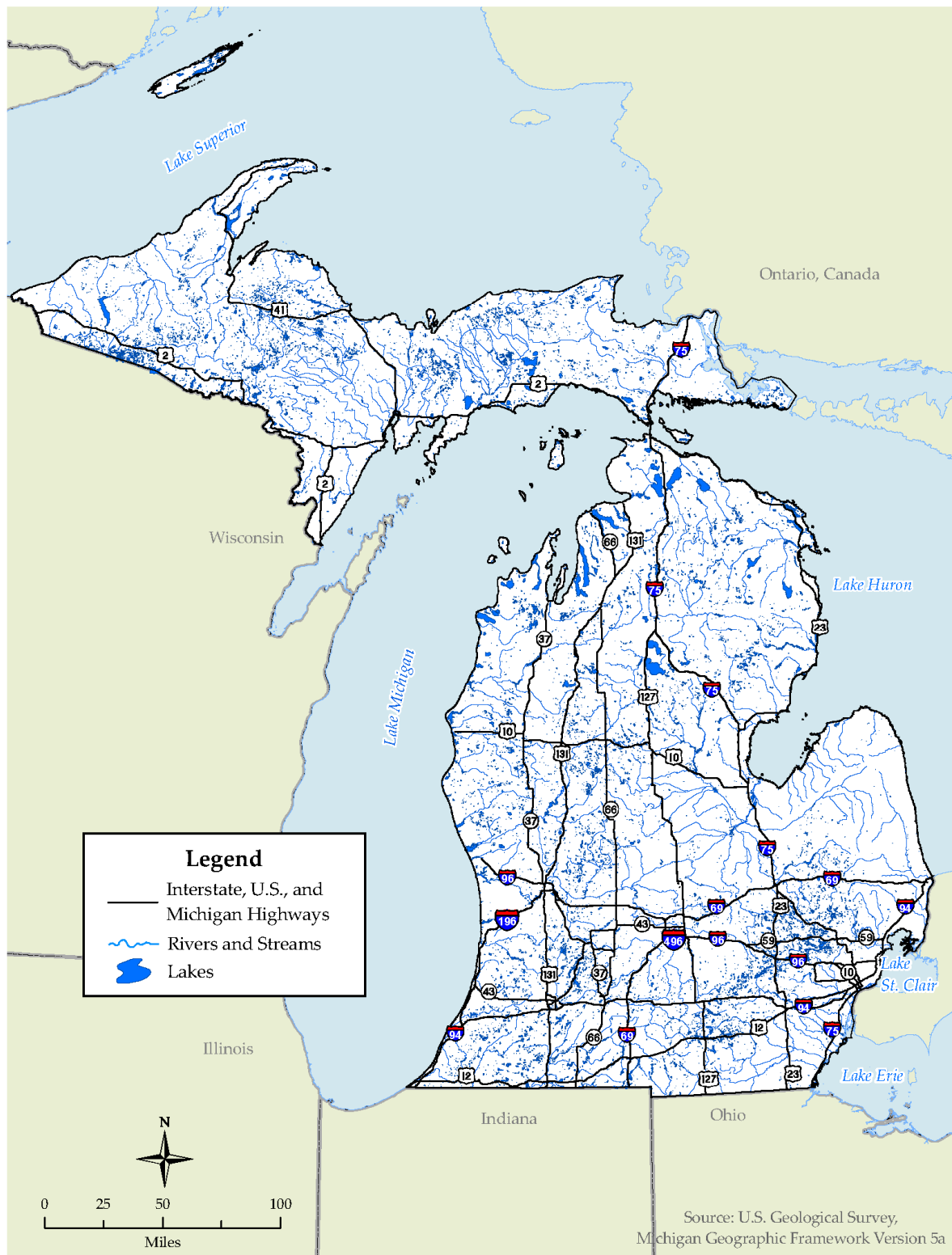
### 2.2.1 Rivers and Lakes

Michigan has an abundance of surface waters (i.e., rivers, lakes and streams) providing a number of uses such as hydroelectric power, recreation, crop irrigation, fisheries, and the transport of goods and people. There are 36,000 miles of rivers and streams in Michigan and 11,000 inland lakes. **Figure 3** shows the location of these surface waters. A number of the rivers and lakes carry special state and national designations, such as Outstanding State Resource Water, Designated Natural River, Wild and Scenic River, and Trout Lake and Stream. The designations involve more stringent environmental regulations for projects located within the respective watersheds.

The construction and maintenance of the state-wide transportation network includes over 10,000 miles of roads and their associated drainage systems. These drainage systems collect and transport pollutants such as sediment, oil, grease, and fertilizer. During rain showers and snow melts these pollutants can enter Michigan's rivers, lakes, and streams, impact flora and fauna, and raise public health concerns. MDOT is committed to reducing or eliminating storm water pollutants by complying with national and state environmental policies and regulations, and applying creative methods and technologies for handling storm water collection and discharge. These actions help to maintain healthy ecosystems and protect potable water supplies.

An example of this is MDOT's compliance with the National Pollutant Discharge Elimination System (NPDES) permit program administered by the Michigan Department of Environmental Quality. A NPDES permit was issued to MDOT in April 2004. The permit is reviewed for compliance and reauthorization every five years. As part of the permit, MDOT has prepared a Storm Water Management Plan (SWMP) that describes current procedures and practices to limit the discharge of pollutants from its drainage systems. The SWMP also documents commitments, by MDOT, to develop additional ways to improve storm water management, such as supporting research into the impact of road salts on the environment, and promoting the use of vegetative buffers and rain gardens in highway design to filter pollutants.

Figure 3: Rivers and Lakes



### 2.2.2 Wetland Communities

Wetlands are typically associated with surface waters but can also occur in isolated situations. **Figure 4** shows the location of wetlands in Michigan. Wetland communities perform a number of important functions including flood control, ground water recharge and discharge, prevention of soil erosion, filtration of pollutants, wildlife habitat, production of economic commodities such as cranberries, and recreation. Some of the wetland types found in Michigan are deciduous swamps, wet meadows, emergent marshes, conifer swamps, wet prairies, shrub-scrub swamps, fens, and bogs. These types vary depending on differences in soil type, topography, climate, hydrology, water chemistry, vegetation, and human disturbance.

Transportation improvements may involve crossing riparian habitats where sensitive wetland communities often exist. When this occurs, more intensive biological assessment is required to determine any adverse effect, directly or through habitat modification, on any sensitive species. This assessment may lead to a modification of the design to avoid or minimize impacts and/or provide for mitigation. One of the challenges MDOT faces is locating suitable mitigation sites within the watershed that is impacted. MDOT works closely with federal, state, and local agencies, identified in **Section 3.2.1, Agency Coordination**, to avoid or minimize impacts to these resources by complying with applicable environmental regulations, applying best management practices, and implementing the latest mitigation techniques.

The following are important stewardship efforts, by MDOT, to protect wetlands and improve the water quality of rivers and lakes:

- In 2005, completed construction of two wetland banks, creating a total of 80 acres of wetlands. This effort will ultimately create bank sites in most of Michigan's watersheds, benefiting both future projects requiring mitigation and the environment with the advanced construction of wetlands; and
- Support research into various aspects of wetland creation and preservation, including the control of invasive species like reed canary grass, Northern White Cedar Restoration, Forested Wetland Creation Research, and a Hydroperiod of Created and Natural Wetlands Study.

Figure 4: Wetlands

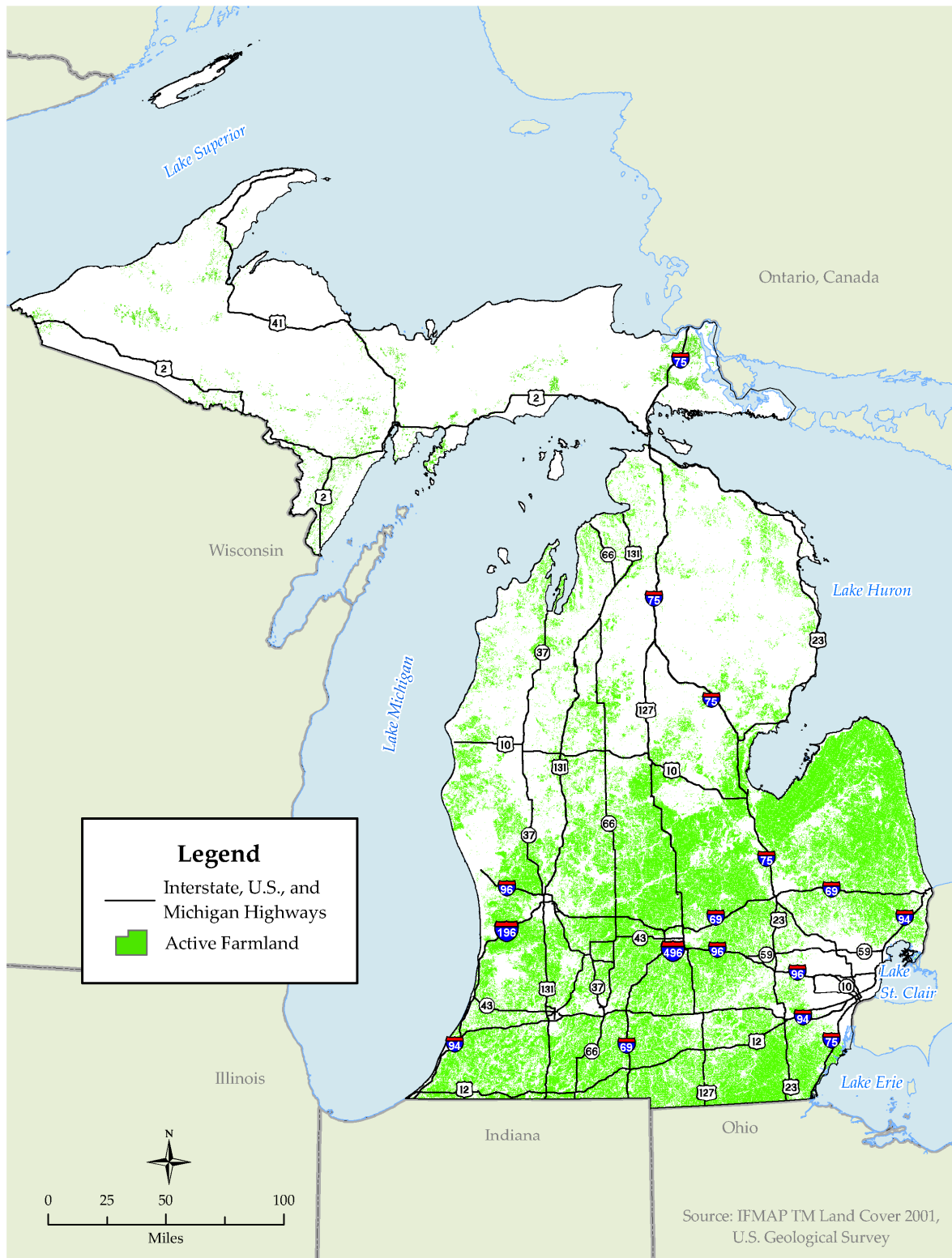


## 2.3 Farmland

Agriculture is Michigan's second largest industry with over 46,000 farms statewide producing more than 100 food and fiber products. Michigan leads the nation in the production of tart cherries, cranberries, black turtle beans, blueberries, cucumbers for pickles, and potatoes for chips. A transportation system that effectively connects major agricultural areas with the urban markets is important to the vitality of the agricultural industry. One MDOT program that advances this connectivity is the Michigan Rail Loan Program. This program awards non-interest bearing loans to rail infrastructure improvements that contribute to the stability and growth of the state's business and industry.

The number of farms throughout Michigan is declining; however, the average farm size has increased. **Figure 5** shows the location of active farmland in the state; 90 percent of farmland is located in the southern portion of the Lower Peninsula. This area also contains the highest population densities, resulting in pressure to convert farmland to urban uses. As urban areas expand, transportation systems built to support urban growth will likely put a strain on farmland. Local and regional land use strategies that preserve farmland through encouraging cluster development and transportation alternatives will help to protect farmland from traditional suburban development patterns. The evaluation of farmland impacts is required of any transportation project where a federal action would result in the conversion of farmland to a non-agricultural use such as road right-of-way or drainage improvements.

Figure 5: Farmland





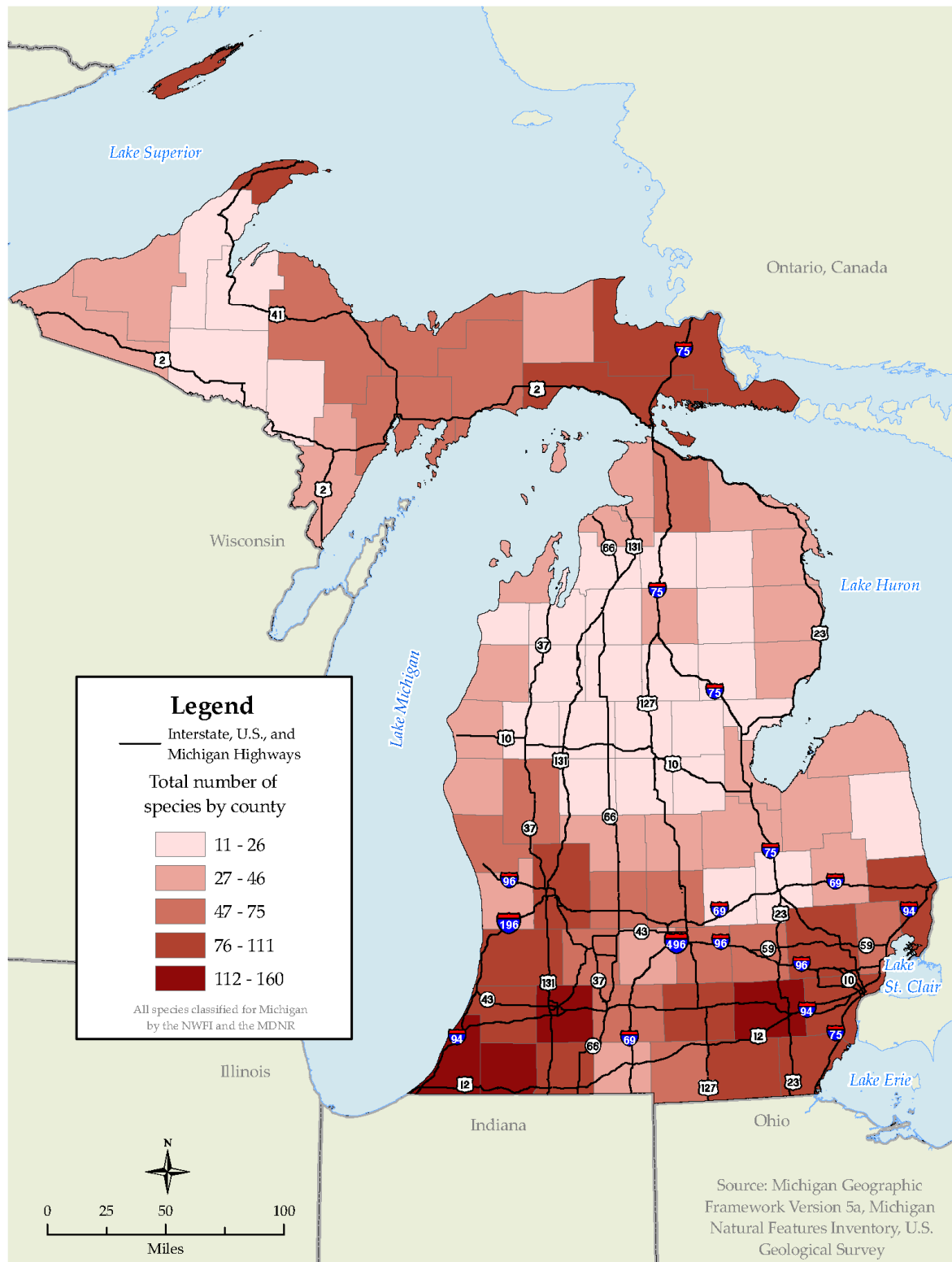
## 2.4 Threatened, Endangered, and Special Concern Species

Michigan recognizes the importance of preserving and protecting its biological diversity. The state has implemented a number of programs to preserve, protect, and enhance natural communities and associated flora and fauna (i.e., the Michigan Natural Rivers Program and the Michigan Natural Features Inventory). In addition, federal and state government have enacted laws to protect important natural communities, threatened and endangered species, and species of special concern that may inhabit these communities. **Figure 6** indicates the location and concentration of threatened, endangered, and special concern species on record. It appears that many of these species are located in the southern portion of the Lower Peninsula. However, a statewide comprehensive, systematic survey has yet to be performed; and, most of the survey work performed to date for the Michigan Natural Features Inventory has occurred in the southern part of the state. As the transportation system in the state expands and/or changes to meet demands over the next 25 years, it is likely that potential impacts to threatened, endangered, and special concern species and their habitats will increase.

A goal of MDOT is to plan and design transportation improvements that respect sensitive natural environments and mitigate any impacts. MDOT is committed to implementing this goal by: (1) reviewing designs for environmental impacts; (2) proposing effective mitigation and monitoring measures; (3) ensuring compliance with local, state, and federal laws and regulations; and, (4) investigating public and agency complaints. MDOT has several on-going efforts to protect endangered plants within state rights-of-way. These efforts, led by MDOT staff, include the following:

- Review of permit applications requesting use of state right-of-way for other activities. The biologists advise the MDOT permit agent and the permit requestor on ways to avoid, minimize or mitigate damage to plants;
- Creation of guidance materials and training for maintenance staff to teach them how to manage endangered plants along our roads;
- Systematic surveying of MDOT property for endangered species, so that project managers and maintenance staff can be advised on ways to avoid them;
- Development of a plan to protect roadside habitat of the endangered Karner Blue Butterfly; and
- Development of a Prescribed Burn Program to help manage plant resources along the roadside.

Figure 6: Threatened and Endangered Species and Species of Special Concern



## 2.5 Air Quality

The Federal Clean Air Act of 1970 and subsequent amendments established national ambient air quality standards for seven “criteria air pollutants:” ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter (PM-10 and PM-2.5), and lead. These standards are meant to protect the health of people and the environment. For transportation projects, ozone, carbon monoxide, and particulate matter are the most important pollutants to consider. A geographic area is known as an “attainment” area if it meets the standards or a “non-attainment” area if it fails to meet the standards. **Figure 7** shows the attainment and non-attainment counties in Michigan for ozone and PM-2.5. Michigan is in compliance with the other criteria air pollutants.

Ozone is a pollutant of particular concern to people with lung and respiratory problems such as asthma. It is not created directly by cars and trucks, but rather by chemical reactions in the atmosphere involving sunlight and precursor emissions such as volatile organic compounds and oxides of nitrogen. These precursors are emitted by motor vehicles and industrial sources. Ozone precursors can be transported by wind for long distances from where they are initially emitted. Therefore, ozone is a regional concern, not just a localized issue. Over the past 20 years, the level of ozone has steadily improved. However, in the last 10 years the rate of improvement has slowed due to meteorological and emission conditions.

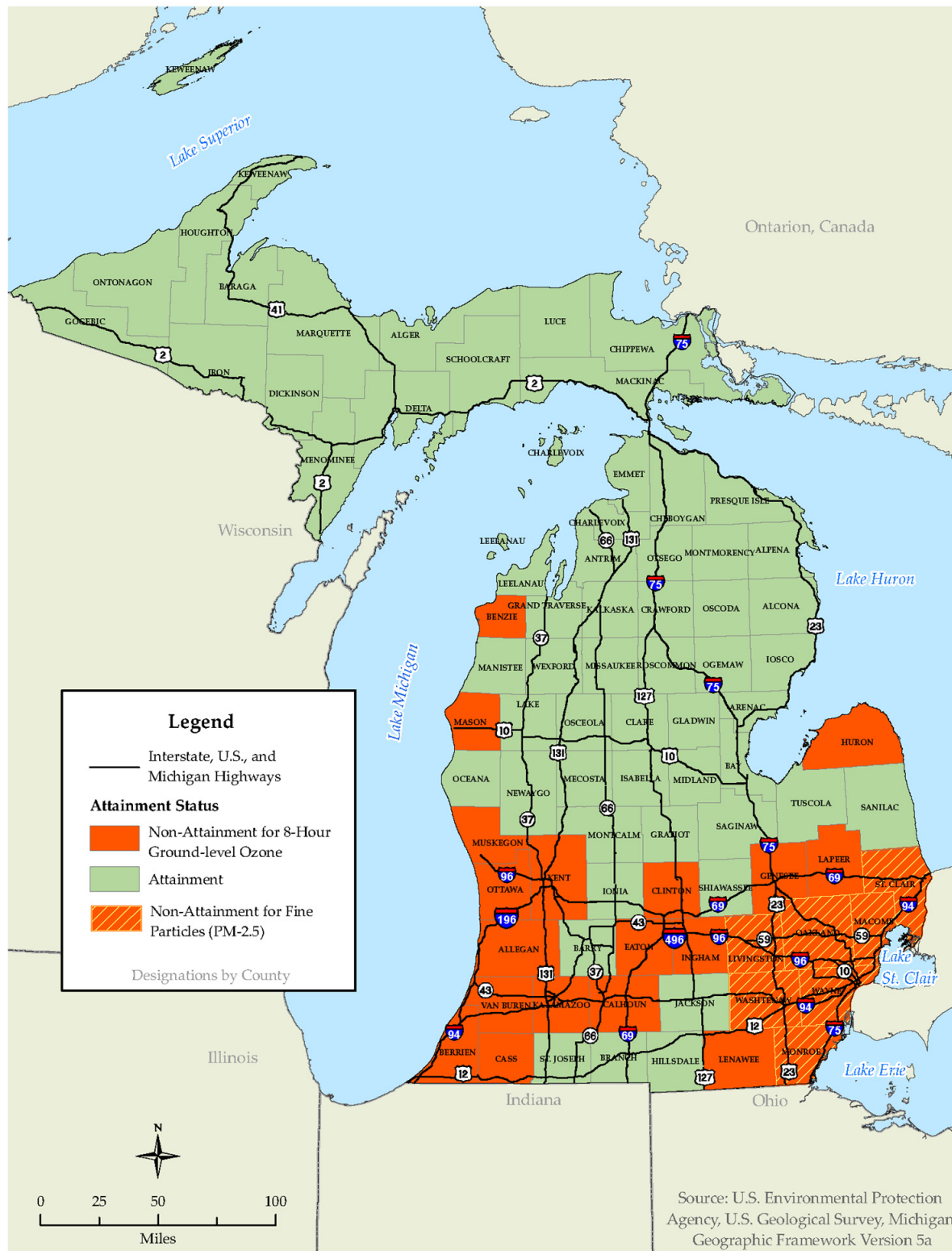
PM-2.5 particulates (2.5 microns or smaller) are generally emitted from activities such as industrial and residential combustion, and from vehicle exhaust. PM-2.5 is a health concern because fine particles can reach the deepest regions of the lungs. Health effects include asthma, difficult or painful breathing, and chronic bronchitis, especially in children and the elderly. Fine particulate matter associated with diesel exhaust is also thought to cause lung cancer. As shown in **Figure 7**, the standards for PM-2.5 are exceeded for a seven-county area comprising the Southeast Michigan Council of Governments.

A conformity analysis is required at a regional level for projects in non-attainment areas. The regional transportation plan for a non-attainment area must demonstrate conformity with planned reductions for ozone and/or PM-2.5 per the State Implementation Plan. Future transportation projects will be compared to the regional plan used in the most recent air quality conformity analysis to determine compliance. Mitigation measures are required for temporary construction impacts to air quality, as well as traffic-generated impacts that do not conform to the adopted plans.

At the stakeholder workshops and public open houses held as part of the visioning process for the *MI Transportation Plan*, there was strong sentiment for transportation modes to be integrated to form a kind of seamless mobility. Ideas included: enhanced ways of moving freight and coordinating that movement with car and passenger traffic; improved connectivity between automobile, passenger rail, bus, and air travel; and, a desire for innovation in water-borne transport. Such a holistic approach could lessen the reliance on the automobile with the likely

result of reducing carbon dioxide emissions. Carbon dioxide is one of the leading gases to reach the atmosphere and help trap heat on Earth, contributing toward global warming.

**Figure 7: Air Quality**



## 2.6 Historic and Archaeological Resources

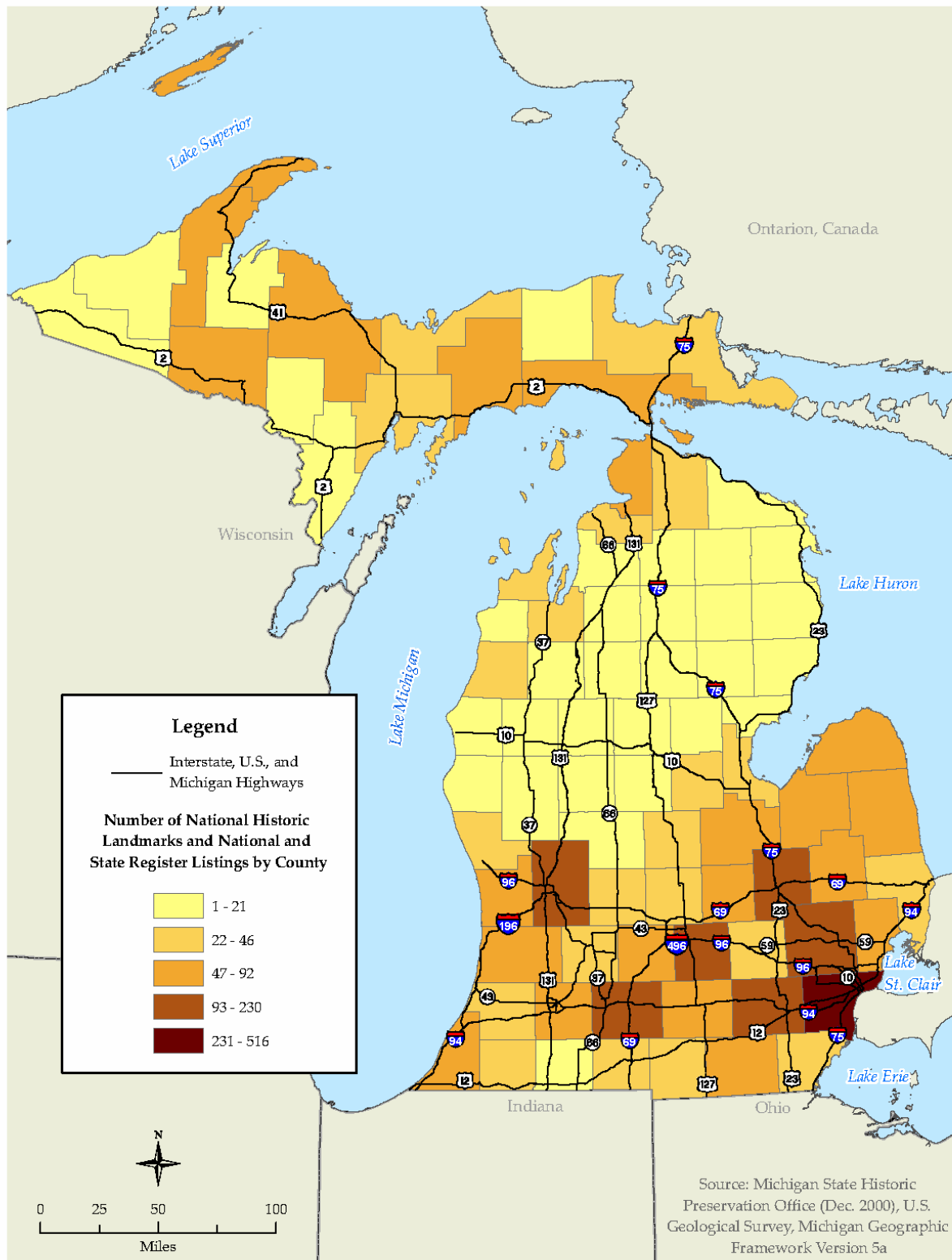
Michigan's historic and archaeological resources combined with its natural resources give the state a unique identity. Historic and archaeological resources are publicly or privately-owned buildings, structures, sites, objects, features or open spaces that are significant in history, architecture, archaeology, engineering, or culture at the local, state, or national level (SHPO, 2002). As of December 2000, Michigan's historic resource survey inventory contained more than 300,000 historic resources. The archaeological files included 18,000 land sites and 1,400 shipwrecks. Historic resources listed on the national and state registry included: 35 national historic landmarks, 1,525 national historic places, 2,276 state historic places, 1,400 state historic markers, and 5,500 centennial farms. **Figure 8** shows the geographical distribution of national and state register listings by county. Of the 83 counties, systematic reconnaissance surveys were performed in 42 counties. Although some counties have been surveyed at the reconnaissance level, many aboveground historic resources in these counties and the unsurveyed counties remain unidentified. Because of the intensive nature of belowground survey work, archaeological resource surveys have been performed on only four percent of the land area in the state. Archaeological sites are fragile and often occur in the top 12 to 18 inches of soil. These sites are under constant threat from ground disturbance activities such as road construction, utility installation, and housing developments.

Future transportation systems can have a positive or negative effect on these historic resources. Land use policies that promote sprawl and unchecked growth will increase the likelihood of new road systems directly or indirectly affecting historic resources. Adopting transportation strategies that slow sprawl and encourage the reuse of existing infrastructures and resources will lower the potential for impacting historic resources, preserve historic farmland and strengthen tourism and agriculture-related industries.

MDOT initiatives that involve the protection and enhancement of historic resources include:

- Exploring the use of new techniques for historic bridge preservation;
- Expanding coordination efforts with Michigan's tribes over various planning and environmental topics; and,
- Publication of an Environmental Research Series – the first volume addressing archaeological modeling to locate deeply buried archaeological sites in southern Michigan.

Figure 8: Historic Resources





## Chapter 3. Policies and Procedures

MDOT follows a wide variety of policies and procedures designed to ensure that environmental impacts are fully considered and environmental laws and regulations are complied with during the design, operation, maintenance, and expansion of Michigan's transportation network. This section discusses MDOT's major policies and strategies for environmental impact minimization and compliance, agency coordination procedures, and MDOT's standard environmental mitigation measures.

### 3.1 Policies and Strategies

Transportation projects receiving federal funding or requiring federal approval action are subject to the federal environmental clearance process governed by the National Environmental Policy Act (NEPA) and its associated regulations. MDOT reviews and classifies between 800 and 1,000 projects each year that require environmental clearance under the NEPA process. Approximately 90 percent of these projects are minor improvements that require a Categorical Exclusion (CE) document. However, MDOT regularly completes more complex projects requiring an Environmental Assessment (EA) or an Environmental Impact Statement (EIS). These studies often take years to complete. Michigan does not have its own specific equivalent of NEPA at the state level. However, MDOT and local authorities must comply with state environmental laws administered by various state departments when implementing transportation projects. These laws and the coordination with other state agencies are discussed in **Section 3.2.1, Agency Coordination**. The various federal and state laws and regulations ensure that environmental impacts are considered and addressed for all transportation projects. A list of key federal and state laws and regulations that must be followed in implementing transportation projects is contained in **Appendix B**.

MDOT has established an Environmental Committee (EC) with membership that crosses organizational lines for the purpose of approving statewide policy and strategies on environmental issues, actions, and related matters. Members represent the full range of MDOT services including planning, design, construction, operation, and maintenance. The mission of the EC is to ensure that MDOT complies with environmental laws in a focused, effective fashion, and to foster an environmental ethic throughout the department. The EC is supported by seven technical teams that provide environmental analysis and recommendations in their area of expertise for EC consideration and action. The EC's responsibilities include:

- Providing a forum to discuss significant environmental issues and policies, as well as options for implementation;
- Ensuring teams address issues within their scope in a timely and effective manner with representation from all applicable areas within MDOT;
- Recommending the creation, elimination, or consolidation of teams;
- Requesting appointments of team members from appropriate areas of MDOT;

- Obtaining consensus agreement when approving or rejecting a recommendation. If a consensus is lacking, present options to the Leadership Team for a decision; and
- Recommending short and long-range environmental program emphases.

MDOT's Project Planning Division in the Bureau of Transportation Planning is responsible for NEPA-related compliance and ensuring that MDOT is a good steward of environmental resources. MDOT's goals include:

- Providing environmental clearance for MDOT projects;
- Providing expert services on interdisciplinary social, economic, and environmental (SEE) issues required for MDOT's transportation planning and project development processes;
- Ensuring MDOT's compliance with local, state, and federal laws and regulations;
- Investigating public and agency complaints;
- Notifying the public of MDOT decisions that may have direct effects on them and allowing the public the opportunity to comment on proposed MDOT programs and projects;
- Ensuring that adverse SEE effects have been fully considered in developing proposals and that final decisions are made in the best overall interest;
- Proposing measures to mitigate impacts and following up on mitigation commitments made by MDOT;
- Providing a link between resources agencies and MDOT;
- Providing a liaison with SEE interest groups; and
- Providing environment related technical and advisory services for MDOT.

### **3.1.1 Context-Sensitive Solutions**

Governor Granholm's Executive Directive 2003-25 instructs MDOT to use Context-Sensitive Solutions (CSS) for transportation projects wherever feasible. Context-sensitive solutions are defined as a "collaborative, interdisciplinary approach involving stakeholders for the development of a transportation facility that fits its physical setting and preserves scenic, aesthetic, historic, cultural and environmental resources, while maintaining safety and mobility" (MDOT, 2006).

MDOT is committed to the implementation of CSS in its planning, design, construction and maintenance processes. MDOT formed a CSS Team to develop and implement further context-sensitive solutions initiatives. The following is a list of some of the key CSS initiatives MDOT is pursuing:

- Educational programs for staff and consultants to develop approaches and skills to implement context-sensitive solutions for transportation projects;
- Partnering with stakeholders to discuss continuous process improvement;

- New opportunities for stakeholder and public engagement, including visioning sessions, and ensuring public views are represented in the project development process;
- Developing strategies for providing project visualizations to promote public understanding of project intents and impacts;
- Using flexibility within state and federal design standards and developing alternative state standards where appropriate;
- Working with local agencies to promote CSS on local projects;
- Partnering with stakeholders in planning and developing multi-modal transportation infrastructure and considering integrated transportation solutions early in the project development process;
- Taking a corridor approach to planning, including aesthetics, multi-modal, heritage routes, and environmental analysis undertaken by an interdisciplinary team working in conjunction with local authorities; and
- Developing an implementation plan to more formally integrate CSS into MDOT's planning, development, and delivery process including methods to measure the success of CSS implementation and opportunities for stakeholder feedback.

## 3.2 Procedures

Most of MDOT's standard environmental procedures are based on the requirements of NEPA and the permit requirements of various federal and state agencies. The level of analysis of potential environmental impacts of a proposed project depends on the complexity and context of the project. Minor improvements such as resurfacing or intersection improvements are most often analyzed under the requirements of a CE. For the simplest projects, a CE may involve filling out a package of forms and distributing the necessary coordination letters. More complex CEs may involve minor fieldwork and short documentation. Improvements with the potential for significant yet unidentified impacts are analyzed under the requirements of an EA. An EA will typically involve field work and a more detailed environmental document. If no significant impacts are identified, a "Finding of No Significant Impact" (FONSI) is requested from the federal approving agency. For major projects, such as construction on a new alignment, where significant impacts are likely or evident, Draft and Final Environmental Impact Statements are completed. These documents require extensive field work and address potential impacts in great detail. At the end of the EIS process, MDOT applies to the federal approving agency for a "Record of Decision" (ROD), approving the project for final design and construction.

The specific impact analysis and documentation procedures used by MDOT are based on the requirements of the federal and state agencies involved in transportation projects and standards and procedures refined through years of practice in completing environmental documents. The means of analysis often depends on the federal approving agency involved in the project, the Federal Highway Administration (FHWA) for roads, the Federal Aviation Administration

(FAA) for airports, the Federal Transit Administration (FTA) for transit projects, and the Federal Railroad Administration (FRA) for rail projects. Each of these agencies has specific standards and regulations for the completion of environmental documents. Environmental analysis procedures for a given project will also depend on which permits are required, if any, from other federal and/or state agencies.

Coordination with relevant federal, state, and local agencies is a crucial part of all MDOT environmental clearance processes for transportation projects, and is discussed below. MDOT has also developed a series of standard procedures for mitigating certain environmental impacts. These are discussed in **Section 3.2.2, MDOT Standard Mitigation Procedures**.

### 3.2.1 Agency Coordination

MDOT actively coordinates with federal, state, and local agencies regarding the potential environmental impacts of transportation projects. The level of coordination depends on the nature of the project and the magnitude of the impacts involved. Early coordination often takes the form of formal letters. For projects with minor or no resource impacts, coordination letters are all that is required. For projects with higher levels of impacts to environmental resources, additional coordination may take the form of project scoping meetings, site tours, designation of agencies as cooperating agencies, mitigation reviews, and memoranda of agreement or understanding. Most of the agencies listed below serve as review agencies and comment on the Environmental Assessments and Environmental Impact Statements prepared by MDOT. A brief discussion of the common coordination issues associated with each agency is included below.

Federal Highway Administration: The Federal Highway Administration (FHWA) is the lead federal agency on all MDOT highway projects involving federal funds. FHWA signs and approves NEPA documents prepared for MDOT highway projects except for Categorical Exclusions completed under a programmatic agreement. MDOT works as a partner with FHWA for all improvements to the National Highway System (NHS) in Michigan.

Federal Aviation Administration: The Federal Aviation Administration (FAA) is the lead federal agency on airport related improvements. MDOT coordinates between the FAA and local airport authorities to ensure that proper environmental documentation is completed for proposed airport improvements.

Federal Transit Administration: The Federal Transit Administration (FTA) is the lead federal agency on transit related improvements. MDOT occasionally reviews environmental documents for transit projects and coordinates with FTA on these documents.

United States Army Corps of Engineers: The United States Army Corps of Engineers (USACE) has jurisdiction over waters of the United States including rivers, streams, floodplains, lakes, ponds, and other wetland areas. By special agreement, the Michigan Department of Environmental Quality regulates most wetland and floodplain issues in Michigan. However, MDOT coordinates with the USACE on projects with substantial wetland impacts or impacts to major and/or navigable rivers, streams, and floodplains.

United States Environmental Protection Agency: The United States Environmental Protection Agency (EPA) is involved in all major MDOT transportation improvement projects and has specific regulatory interests in air quality, water quality, and hazardous materials issues. The EPA acts as a clearinghouse for the publishing of federal notices regarding the availability of environmental clearance documents such as Environmental Impact Statements. MDOT actively works with the EPA regarding the major environmental issues on transportation projects including potential environmental mitigation on projects requiring EA and EIS documents.

United States Department of Agriculture: The United States Department of Agriculture's Natural Resources Conservation Service (NRCS) is the federal agency charged with the protection of farmland and the soils that support farmland. MDOT consults with the NRCS and completes the required evaluation of farmland impacts where the project has the potential to affect agricultural land or soils.

United States Forest Service: The United States Forest Service (USFS) manages public lands in national forests and grasslands. MDOT consults with the USFS on projects that may affect federal resources or occur on USFS lands.

United States Fish and Wildlife Service: The United States Fish and Wildlife Service (USFWS) has specific jurisdiction over the protection of federally-listed threatened and endangered species, as well as a general interest in the protection of all wildlife and aquatic resources. MDOT coordinates with USFWS on all projects that have the potential to impact threatened and endangered species and completes the necessary evaluations and documentation required under Section 7 of the Endangered Species Act when impacts are likely to occur.

United States Department of the Interior: MDOT coordinates with various agencies within the United States Department of the Interior (USDOI) when projects have the potential to affect USDOI resources. USFWS is one USDOI agency. Other USDOI agencies include the Bureau of Indian Affairs, the Bureau of Land Management, and the National Park Service. MDOT coordinates with the relevant USDOI agencies regarding potential impacts of transportation projects to Federal lands and lands, which received land and water conservation funds.

United States Coast Guard: The United States Coast Guard has permit jurisdiction regarding impacts to navigable waterways including rivers and lakes. MDOT coordinates with the Coast Guard whenever a project has the potential to impact navigable waterways.

Other Federal Agencies: MDOT coordinates with a number of other Federal agencies during the environmental clearance process for transportation projects. Most often, this coordination involves submission of the environmental document to the agency for review as part of the normal distribution of Environmental Assessments and Environmental Impact Statements. In unique situations such as border crossing improvements, some of these federal agencies, such as US Customs and Border Protection, may take a more active role. The following are additional federal agencies that may be involved in MDOT transportation projects:

- Advisory Council on Historic Preservation;
- Federal Emergency Management Agency;

- United States Department of Commerce;
- United States Department of Energy;
- United States Department of Health and Human Services, Centers for Disease Control and Prevention;
- United States Department of Housing and Urban Development;
- United States Customs and Border Protection; and
- United States General Services Administration.

Michigan State Historic Preservation Office: MDOT coordinates with the Michigan State Historic Preservation Office (SHPO) regarding potential impacts to cultural resources, including historic and archaeological sites potentially eligible for the National Register of Historic Places. MDOT has a Programmatic Agreement with the SHPO regarding coordination procedures, timeframes for review, and review procedures and administration of the Section 106 process. When there are potential impacts to cultural resources, MDOT follows the Section 106 process for identifying and addressing these impacts.

In this process, the SHPO is consulted. In addition, a number of interested parties may also be part of the process including Native American Tribes, local historical associations, and other stakeholders interested in historic preservation. MDOT coordinates with the SHPO regarding an “Area of Potential Effect” for historic and archaeological resources, and any impacts to these resources once project alternatives are identified and refined.

Cultural resources eligible for the National Register of Historic Places are also protected under Section 4(f) of the Department of Transportation Act of 1966. For a transportation project to impact these resources, MDOT must prove that there is no prudent or feasible alternative to impacting the cultural resource.

Michigan Department of Natural Resources: MDOT coordinates with the Michigan Department of Natural Resources (MDNR) regarding the following potential impacts of transportation projects:

- Fisheries issues;
- Wildlife issues;
- Threatened and endangered species;
- Designated “Natural Rivers;”
- Parks and recreation issues affecting navigable waterways or MDNR-owned facilities;
- Forest, mineral, and fire management issues; and
- Effects on MDNR-owned land, including effects of wetland mitigation.

In October 2005, MDOT and MDNR signed an Early Coordination Memorandum of Agreement that designated a process by which MDOT and MDNR will coordinate during the early stages



of a project including data to be provided by MDOT, response times from MDNR, site visits, documentation of the coordination process, and conflict resolution.

Michigan Department of Environmental Quality: MDOT coordinates with the Michigan Department of Environmental Quality (MDEQ) regarding a number of issues related to the protection of the natural environment. Projects that involve impacts to jurisdictional wetlands, stormwater discharge, floodplain fill or work below the ordinary high water mark require a permit from MDEQ's Land and Water Management Division. Permits are also often needed from MDEQ's Air Quality Division for the operation of certain construction equipment. MDOT has an approved operating erosion and soil control program on file with MDEQ that meets legislative requirements. MDOT has been designated an "Authorized Public Agency" in this regard, however, MDEQ may inspect MDOT and contractor practices to ensure they are in compliance. MDOT must also follow MDEQ notification provisions with respect to demolitions and their potential effects on groundwater.

MDOT coordinates with MDEQ throughout the project development, design and construction phases of projects involving resource impacts. Early coordination is based around resource and issue identification. As alternatives are developed and refined, coordination with MDEQ is focused on impacts and potential mitigation. Coordination often includes letters, site tours, meetings, MDEQ review of environmental documents, technical memoranda, and mitigation plans. On complex projects with significant potential resource impacts, MDEQ representatives may become members of the project steering committees.

In 1984, Michigan received authorization from the federal government to administer Section 404 of the Federal Clean Water Act in most areas of the state. In many other states, applicants must apply to the US Army Corps of Engineers and a state agency for wetland permits whereas; applicants in Michigan generally submit only one wetland permit application to MDEQ. As a result of this authorization, MDOT coordinates extensively with MDEQ regarding wetland impacts and mitigation, and has established practices including standard wetland mitigation ratios.

Other State Agencies: MDOT coordinates with a number of other state agencies during the environmental clearance process for transportation projects. Most often, this coordination involves submission of the environmental document to the agency for review as part of the normal distribution of Environmental Assessments and Environmental Impact Statements. Agencies with a particular interest in social, community, or economic issues such as the Michigan Economic Development Corporation or the Michigan Family Independence Agency, often provide information to assist in the evaluation of impacts. The following are additional state agencies that may be involved in transportation projects:

- Michigan Economic Development Corporation;
- Michigan Department of Community Health;
- Michigan Environmental Science Board;
- Michigan Department of Agriculture; and

- Michigan Family Independence Agency.

NEPA/404 Concurrence Process: The NEPA/404 concurrence process is a cooperative effort that merges elements of NEPA and Section 404 (Clean Water Act) processes and builds consensus by all agencies involved. The overall goal is to assure timely, cost-effective development of needed, environmentally-sensitive transportation projects. The NEPA/404 Concurrence Process is normally applied only to major projects. There are five federal agencies that have signed on to this process: FHWA, EPA, USACE, USFWS, and the Coast Guard. In addition, MDOT has signed a similar agreement with MDEQ and MDNR. The process includes three written project concurrence points where the agencies agree that adequate information has been provided to date and the project can move to the next stage of project development. The agencies agree not to revisit previous steps unless conditions change. The three concurrence points are:

1. Purpose and Need;
2. Alternatives to be Carried Forward; and
3. Recommended Alternatives.

The NEPA/404 concurrence process ensures that most of the major issues or disagreements between the agencies have been identified and addressed so that subsequent stages of the project are not delayed.

Local Agency Coordination: All MDOT projects involve coordination with local agencies including cities, townships, county road commissions, county planning agencies, local emergency service providers, and metropolitan planning organizations (MPOs). The involvement of these agencies during the environmental process depends on the magnitude of the project and may range from coordination of detour routes during road repair to regular meetings over the course of a major improvement project. Local land use, economic, transportation, recreation, and emergency management plans are often inputs into environmental analysis conducted by MDOT.

MDOT coordinates with MPOs regarding all MDOT-initiated transportation improvements contained in the MPOs' long-range transportation plans. In metropolitan areas that are not in attainment for certain EPA mandated air quality standards, the MPO is responsible for developing and implementing an air quality conformity plan. MDOT must coordinate with the MPO in developing conformity analysis for transportation improvements.

### **3.2.2 MDOT Mitigation Procedures**

Mitigation is defined as the elimination, reduction, or control of the negative environmental effects of a project, and includes measures to address any damage to the environment caused by such effects through replacement, restoration, compensation, or any other means. Although some negative impacts from transportation projects are unavoidable, MDOT, through route location, design, and environmental and construction processes, takes precautions to protect as many social and environmental systems as possible (MDOT, March 2005). Many mitigation measures are project specific and are negotiated with the respective resource agencies depending on the nature and severity of the impact. The project specific mitigation measures

are included on a “green sheet” which is included in every EA and EIS. MDOT’s Project Planning Division also maintains a list of standard mitigation measures for transportation that covers a wide variety of potential impacts. The standard mitigation measures related specifically to construction procedures are also contained in the Michigan Standard Specifications for Construction. The following is a list of potential environmental impacts covered in MDOT’s standard mitigation measures:

- Right-of-way acquisition and relocation;
- Water quality;
- Soil erosion and sedimentation control;
- River, stream, and drain crossings;
- Existing vegetation;
- Hazardous/contaminated material;
- Groundwater quality;
- Disposal of surplus or unusable material;
- Maintaining traffic during construction;
- Continuance of public utility service;
- Construction noise and vibration impacts;
- Control of air pollution during construction;
- Threatened and endangered species; and
- Migratory birds.

### **3.2.3 New Procedures Under SAFETEA-LU**

The *Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users* (SAFETEA-LU) was signed into law on August 10, 2005, and includes changes to environmental procedures that MDOT must adopt. As part of the requirements for SAFETEA-LU, statewide transportation plans must include a discussion of the types of potential environmental mitigation activities to be developed in consultation with federal, state, tribal, and local agencies responsible for land management, wildlife, and regulatory activities.

SAFETEA-LU also introduced new review procedures for environmental documents that are mandatory for EISs and optional for EAs, at the discretion of the secretary of transportation. This new process includes enhanced obligations for a public comment process during the Purpose and Need and Alternatives phases of the project. It also requires the development of a coordination plan and schedule that must be provided to all participating agencies and made available to the public. The new procedures also establish a 180-day statute of limitations for legal challenges to projects that include a published notice in the *Federal Register* that a permit, license, or approval action (such as a ROD) is final. The prior statute of limitations was up to six

years. EIS projects for which a notice of intent to prepare an EIS was published in the *Federal Register* prior to August 10, 2005, are exempt from the new requirements unless the State Department of Transportation chooses to subject the project to the new guidelines.

SAFETEA-LU included changes to the application of Section 4(f) of the Department of Transportation Act of 1966, which restricts the use of land from parks, recreation areas, wildlife and waterfowl refuges, and historic sites. Section 4(f) states that these lands may only be used for transportation projects if there is no prudent and feasible alternative use. If Section 4(f) land is to be used for a transportation project, extensive documentation is required, that demonstrates no prudent and feasible alternatives exist and discusses the impact and mitigation in detail. SAFETEA-LU introduces a provision where the requirements of Section 4(f) will be considered satisfied if it is determined that a transportation project will have only a “de minimis impact” on the 4(f) resources. The provision allows avoidance, minimization, mitigation, and enhancement measures to be considered in making the de minimis determination. The agency, which has jurisdiction over the land in question, must concur in writing with the de minimis determination. De minimis impacts related to historic sites are defined as the determination of either “no adverse effect” or “no historic properties affected” in compliance with Section 106 of the National Historic Preservation Act (NHPA). De minimis impacts on publicly owned parks, recreation areas, and wildlife and waterfowl refuges are defined as those that do not “adversely affect the activities, features and attributes” of the Section 4(f) resource (FHWA, December 2005).

SAFETEA-LU includes a provision, which allows state departments of transportation to make determinations and assume the responsibility and liability for CEs. On April 4, 2006, FHWA issued guidance and a draft memorandum of understanding for use in transferring this authority to the states. In January 2004, MDOT signed a programmatic agreement with FHWA, which gives MDOT responsibility for CE determinations. The provision will have little effect on existing MDOT procedures.

SAFETEA-LU also includes a requirement that Intelligent Transportation System (ITS) activities be covered under Categorical Exclusion environmental documents “to the extent possible.” According to FHWA guidance, most ITS activities already qualify as CEs and FHWA and FTA are unaware of delays in implementing ITS activities due to environmental review (FHWA, September 2005). This provision should have minimal impact on MDOT environmental procedures.

Another federal environmental regulatory change worth noting is under FHWA’s Special Experimental Program No. 15 (SEP-15), a program targeting innovative public-private partnership approaches to project delivery. It is related to SAFETEA-LU’s more permissive approach to tolls on the federal-aid system. SEP-15 allows states to reduce the number of alternatives considered during the environmental documentation process if the only alternatives that are affordable, from foreseeable revenues, are toll projects. While there are no toll roads in Michigan today, this ruling may have implications for future large-scale freeway improvement projects.

## Chapter 4. Environmental Goals and Objectives

The vision statement in the *2000-2025 Michigan State Long-Range Transportation Plan - Mobility is Security* identifies the following environmental goal:

“Provide transportation systems that are environmentally responsible and aesthetically pleasing.”

This goal is supported by a number of objectives and strategies, as follows:

- Protect, preserve, and enhance aesthetic and visual qualities;
- Plan and design transportation improvements that respect sensitive or unique natural, scenic, and cultural environments;
- Mitigate environmental impacts;
- Incorporate creative design in transportation infrastructure to reflect Michigan’s cultural, natural, and artistic heritage;
- Encourage local participation in aesthetic work; and
- Work with other agencies to ensure the selection and implementation of transportation projects does not adversely affect the environment.

MDOT has taken steps to achieve these objectives and strategies by reviewing internal processes involved with transportation planning and project development. The Project Planning Division of MDOT has identified six processes where environmental planning and transportation planning can best interface to produce transportation systems that are environmentally-responsible and aesthetically pleasing. These processes are: (1) environmental clearance, (2) compliance, (3) public involvement, (4) mitigation, (5) program management, and (6) technical and analytical services.

Key issues, identified by MDOT staff, that currently present the most challenge and opportunity include wetland banking, air quality, streamlining the environmental documentation process, a system-based approach to impact assessment and mitigation, and early community involvement in the planning and design process. MDOT actions associated with these issues are advancing the goals and objectives of the *2000-2025 Michigan State Long-Range Transportation Plan*. For example, the context-sensitive design process is being incorporated into transportation projects wherever feasible. This action addresses the issue of engaging the community early in a project and can result in achieving the objective of designing transportation projects that respect the unique culture and heritage of an area. A specific example of this is a pilot program that MDOT is leading to help communities plan for new development adjacent to freeways, by discouraging noise sensitive land uses in areas where the topography and future traffic noise may lead to uncomfortable noise levels. This effort may result in the development of a model local noise ordinance.

As part of the *MI Transportation Plan* process, input on developing a new vision for transportation in Michigan was solicited from stakeholders and the public. The participants

consistently ranked “environmentally friendly” and “sustainable” as two of the top attributes for a future transportation system. Under these categories, minimizing impact on the environment was frequently cited as a key issue. This is in alignment with MDOT’s focus on stewardship of the environment.

## Chapter 5. Environmental Strategies of FHWA, FAA, FRA, and FTA

The Federal Highway Administration is committed to ensuring that highway improvement projects preserve and protect the natural environment to the extent possible. The FHWA requires transportation plans and operations to address impacts to the natural environment and, as such, supports and encourages state departments of transportation to focus on innovative mitigation strategies that address ecosystem and habitat conservation needs in areas where federal-aid projects are planned or underway. The following are selected goals of the FHWA that target key environmental resources:

- To promote transportation solutions that enhance communities and protect the natural and built environment;
- To collaborate on environmental and climate change concerns;
  - to enable the transportation sector to contribute to national goals for greenhouse gas reductions; and
  - to ensure that the nation’s transportation networks are prepared to address the potential long-range effects of global climate change;
- To encourage the transition to a hydrogen economy through development, demonstration, and deployment of advanced vehicle technologies;
- To improve DOT-owned or controlled facilities by preventing pollution and disposing of obsolete, federal -owned, merchant-type vessels of 1,500 gross tons or more; and,
- To conduct research and test technologies that improve energy efficiency, foster the use of alternative fuels, reduce vehicle emissions, and treat ballast water.

The FHWA and the EPA recently launched the Green Highways Partnership (GHP), a ground breaking collaborative approach between the FHWA, the EPA, the American Association of State Highway and Transportation Officials, and industry associations. These partners are currently focusing their efforts in the Mid-Atlantic region. The GHP is a voluntary, collaborative public/private effort designed to identify and promote streamlining and environmental stewardship in transportation planning, design, construction, operation, and maintenance. Three teams will initially concentrate on storm water management, recycling, and environmental stewardship. The teams will identify best practices in these areas and develop fact sheets, case studies, and tool kits to distribute to private and public agencies and companies involved in planning, design, construction, operations, and maintenance of roadways.



The mission of the Federal Aviation Administration (FAA) is to provide leadership in planning and developing a safe, efficient national airport system. A consideration of the FAA in carrying out this mission is the environmental compatibility of major airport actions. The FAA has adopted policies and procedures for compliance with NEPA to ensure that FAA personnel have clear instructions to address potential environmental effects resulting from major airport actions.

The Federal Railroad Administration (FRA) implements departmental environmental policies related to the nation's railroads. This includes such things as implementation of a hazardous materials safety program, promotion of high-speed rail systems and greater use of railroads for freight transport thereby reducing energy consumption and air pollution, and the review of environmental impacts of projects for compliance with NEPA.

The Federal Transit Administration (FTA) administers federal funding to support a variety of local public transportation systems throughout the United States, including buses, subways, light rail, commuter rail, streetcars, monorail, passenger ferry boats, inclined railways, and people movers. The appropriating legislation for the FTA is SAFETEA-LU. Projects funded by the FTA must abide by the environmental regulations and procedures outlined in this legislation and meet the requirements of NEPA and related environmental laws. In addition, the FTA funds initiatives such as Transit Oriented Development that help to reduce auto trips, increase pedestrian mobility, promote energy conservation, and improve air quality.

## Chapter 6. Integration

The environmental considerations of this report and the associated *Socioeconomic Technical Report* and *Travel Characteristics Technical Report* are critical to the development of an integrated vision for transportation in Michigan. Unlike modes of transportation that have specific travel and user segments, the environmental implications of the transportation system affect stakeholder groups who are both users and non-users of the system. For example, property owners abutting transportation facilities are an important group of stakeholders, as are industries dependent on the transportation of hazardous materials and commodities and the carriers on whom such shippers depend. Certain industries in Michigan, such as real estate, tourism, and agriculture, may be positively or adversely affected by the localized and statewide effects of the transportation system on environmental quality. Consequently, there are a number of segments of environmental stakeholders who are economically dependent on the environmental sustainability of Michigan's transportation system. The following is a synopsis of how the findings of this report are relevant to the larger vision of an integrated transportation system.

### 6.1 Environmental Stakeholders

Key stakeholder groups in the environmental implications of Michigan's transportation system include those industries, populations and businesses whose economic performance may be

affected by Michigan's environmental quality as it relates to the transportation system. These stakeholders include:

### **6.1.1 Businesses and Property Owners Abutting Transportation Facilities**

Business and property owners abutting ports, highways, railroads, and other facilities have a special interest in the management of this infrastructure beyond the real estate value of the land. These economic actors in Michigan are often stakeholders in localized decisions about access management, right-of-way acquisition, and specific mitigation measures that enable the profitable operation of businesses. As with other property owners affected by the system, mitigation and the NEPA process offer some protection. An environmentally-responsible transportation plan must take into account the trade-offs associated with accessibility and environmental quality for the value and use of real estate in Michigan's communities. The *Land Use Technical Report* further explores the linkage between the suitability of land for economic activity and the environmental quality afforded by responsible transportation system management.

### **6.1.2 Households and Neighborhoods**

Households are very sensitive, not only to the health issues of environmental quality addressed directly in the NEPA process, but also in the livability of the human environment. Issues such as the aesthetic quality of a city street, the ease of walking and connecting with neighbors and nearby institutions, and the proximity to wildlife and open space all affect Michigan's ability to attract and retain valuable workers. In addition, special attention must be given to minority and low-income population segments to ensure there is not a disproportionately adverse impact to this group caused by changes or improvements in the transportation system. An example of this is when a proposed highway divides an established neighborhood or introduces adverse air, noise, or traffic impacts to an area. This linkage is further discussed in the *Socioeconomics Technical Report* and *Land Use Technical Report*. Consequently, the efforts in this report pertaining to context-sensitive design and context-sensitive solutions are critical elements of an integrated transportation vision supporting environmental quality and economic vitality.

### **6.1.3 Agriculture, Fishery, and Forestry Businesses**

Environmental quality directly affects the agriculture, fishery, and forestry businesses. If Michigan's lakes, agricultural lands, and forests are damaged by direct or indirect effects of emissions, noise, right-of-way, or other transportation impacts, these sectors will suffer economic consequences. As with many other areas, NEPA and other laws are in place to protect these lands and natural resources. In addition to meeting these basic requirements, an integrated transportation vision for a system supporting Michigan's economic vitality must proactively safeguard the natural resources supporting these industries by involving industry stakeholders early and directly as programs are delivered in agricultural-, fishery-, or forest-dependent areas.

### 6.1.4 Tourism Businesses

The importance of tourism in Michigan's economy is described in the *Economic Outlook Technical Report*, the *Travel Characteristics Technical Report*, and the *Socioeconomic Technical Report* of *MI Transportation Plan*. Tourism is highly dependent both on the health and on the aesthetic quality of Michigan's natural environment. Unsightly highway concepts or right-of-way acquisition that costs attractive wildlife, or other natural resources of interest to tourists, jeopardizes this important industry for Michigan. Because tourism depends on the natural environment, but also generates sporadic and seasonal traffic patterns, trade-offs between the accessibility and preservation of Michigan's natural tourist destinations will often come to bear on transportation infrastructure decisions.

## 6.2 Environmentally-Sensitive Activities

The nature of environmentally-sensitive activities mirrors the concerns of those stakeholder groups in Michigan's economy that depend on both the transportation system and Michigan's environmental quality. The following is a brief summary of particular activities of each stakeholder group that may involve trade-offs between environmental quality and transportation efficiency.

### 6.2.1 Businesses and Property Owners Abutting Transportation Facilities

Key activities include the day-to-day activities that occur on any property abutting a transportation facility. Trade-offs include the added value that owners may get from immediate access to the transportation facility while managing a tolerable amount of noise, safety, risk, or aesthetic compromise required for the environment to remain suitable for its primary purpose. Businesses have the trade-off between the need to generate travel demand and traffic and the need to manage access to these locations and prevent the transportation system itself from becoming an impediment to the quality of development.

### 6.2.2 Households and Neighborhoods

Key activities include family and educational activities, sleep, recreation, and quiet enjoyment of the home. Trade-offs include the need of a household to be in proximity to transportation facilities to access needs away from home and the need to have enough distance from major roadways or other transportation facilities to provide safe and healthy environments for family or personal lifestyles.

### 6.2.3 Agriculture, Fishery, and Forestry Businesses

Key activities include tending and harvesting crops, lumber, fish or other forest or farm products, as well as preparing them for shipping to warehouses or distribution centers, and carrying them on and off the property in seasonal cycles. Trade-offs includes the need for seasonally-appropriate infrastructure without stimulating further development in the off-season that might jeopardize the land or other resources on which these businesses depend. Trade-offs also include the need for access to transportation systems and intermodal facilities,

while maintaining enough distances from these facilities to remain in proximity to the otherwise remote habitats, fields, and environmental locations where agriculture, fishing and forestry must occur.

#### **6.2.4 Tourism Businesses**

Key activities include recreational activities such as hiking, camping, swimming, hunting, fishing and hospitality, as well as leasing properties and the visiting eating and drinking establishments. Other activities include the travel to and from key tourist locations, parking at such locations, and the disposal of refuse from such locations. Like agriculture, fishery and forestry, these activities are often seasonal in nature. Trade-offs include the need to conserve the natural resources that attract and sustain the tourist trade, while also managing the seasonal traffic into and out of these locations and accommodating the parking and other connections associated with this type of travel. There are also trade-offs associated with maintaining the health and safety of these activities while ensuring their accessibility (for example, the need to provide safe pedestrian crossings or pathways on a scenic roadway or parkway, or the need to allow for wildlife crossings in wilderness areas).

### **6.3 Challenges and Opportunities**

#### **6.3.1 Performance Barriers**

Performance barriers are those issues on Michigan's transportation system that inhibit the valuable activities described above from occurring, or that exacerbate the cost of environmental trade-offs associated with economic activities. These are transportation environmental issues and dilemmas that threaten to jeopardize Michigan's economic performance.

##### **6.3.1.1 Congestion**

While congestion is often understood as a mobility issue, it can also interfere with the accessibility and quality of the natural environment. If roadways to agricultural, forested, maritime, or recreational areas are inadequate to carry the seasonal traffic for these activities, Michigan's competitiveness for the above-mentioned industry suffers. However, if congestion triggers widening projects requiring large amounts of right-of-way and loss of land and trees, reduction in air quality, etc., the overall quality of the environments needed for these activities is diminished. Consequently, the management of seasonal patterns of congestion, in ways that safeguard natural resources while enabling efficient access to them, is a key success factor for an integrated plan.

##### **6.3.1.2 Maintaining the Quality of Life**

When trade-offs are not managed, or are managed in such a way that jeopardizes environmental quality, Michigan's quality of life suffers. For example, if a major highway widening project eliminates pedestrian access between a residential community and commercial and recreational activities, the value of the neighborhood may be diminished, regardless of whether it is in a cohort meeting the definition of "environmental justice."

Therefore, when a transportation investment affects environmental quality for any population there is a threat both to the value of property and to the appeal of Michigan as a home for a competitive workforce. Consequently, context-sensitive solutions are critical to avoiding barriers to Michigan's quality of life and economic performance, both for reasons of environmental justice as well as Michigan's overall economic competitiveness.

### **6.3.1.3 Destruction of Natural Habitats**

If natural habitats such as fields, forests, streams and agricultural lands are damaged by the location of transportation facilities, Michigan's natural resources may suffer in ways that impede the state's economic performance. Laws protecting wetlands as well as the NEPA process are designed to protect many of these habitats. However, secondary effects of transportation investment patterns may jeopardize certain resources. For example, urban sprawl and land use patterns associated with ex-urban highway development can jeopardize open space, forests, and agricultural lands in ways that do not violate wetlands regulations or NEPA. Consequently, transportation investments that are sensitive to the transportation-land use relationship may avoid or remove performance barriers posed by the destruction of natural habitats following certain types of transportation facilities. The relationship between transportation investments and the responsible use and management of land is further discussed in the *Land Use Technical Report*.

## **6.3.2 Opportunities**

### **6.3.2.1 Context-Sensitive Solutions**

This report has emphasized the importance and role of context-sensitive solutions and context-sensitive design. Context-sensitive solutions can avoid many of the potential barriers to economic performance associated with transportation infrastructure trade-offs. Furthermore, context-sensitive solutions may, in some cases, trigger the valuable economic activities described in this report by accentuating the natural and environmental resources made accessible by projects. If a context-sensitive solution can make a natural resource accessible and maintain its quality at a higher level than another solution, then it is possible that the activity will carry a higher economic value.

For example, if a roadway facility to a scenic lakefront recreational community is developed in a context-sensitive manner, reducing the travel time to the facility by 50 percent and maintaining 100 percent of the aesthetic quality of the lake, then the market for lodging at the lake would increase (due to the larger travel-shed). This would enable the hospitality business to charge a higher rate (hence generating more revenue). This is superior to an arrangement whereby the travel time may have been reduced by 50 percent, but the aesthetic quality is diminished by 50 percent, which would increase the potential geographic market, but reduce the overall appeal of the location.

Consequently, context-sensitive solutions, especially those offering the same level of access, safety, and mobility as other solutions, can create economic value by overcoming difficult trade-offs.

### 6.3.2.2 Aesthetic and Environmental “Amenities”

Aesthetic and environmental amenities may include investments such as highway wildflower programs, beautification projects, scenic byways, and preservation of historic transportation facilities. Other amenities may include recreational trails or waterways. These investments are often covered under the SAFETEA-LU Enhancement Program, and can make natural resources more accessible and more valuable. For example, a recreational trail surrounding a lake may stimulate demand for services near the lake as a recreational destination and may make different establishments surrounding the lake more accessible without adverse traffic impacts.

Amenities can create substantial value for the stakeholders and activities described in this report. Their importance is further addressed in the *Economic Impact Analysis* of the *MI Transportation Plan*.

## 6.4 Integrating Environmental Planning

The integration of environmental considerations into *MI Transportation Plan* entails observing and exceeding the basic considerations of national and state environmental protection guidelines. An integrated approach entails safeguarding the state’s natural resources by managing the trade-offs between valuable activities and access to those activities regardless of mode. This involves the management of multi-modal corridors and activity centers in ways sensitive to the trade-offs and the economic interests highlighted in this report. The *Integration Technical Report* builds on the segments, stakeholders, and activities introduced in this and other technical reports as well as on the public vision to support an integrated and environmentally-responsible long-term vision for transportation in Michigan.



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## **Appendix B – Key Environmental Legislation, Regulations and Guidance**

<i>Legislation, Regulation, or Guidance Document</i>	<i>Key Subject</i>
National Environmental Policy Act, 1969 as amended and associated regulations	Basis for evaluation of environmental impacts for Federal actions.
Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA: 40 CFR 1500-1508	Regulations for Federal agency implementation of NEPA.
23 USC 109 (h), Economic, Social, and Environmental Effects; et al.	Assures that possible adverse economic, social and environmental effects of proposed highway projects are fully considered.
Section 4(f) of the DOT Act, as amended	Preservation of publicly owned parklands, waterfowl and wildlife refuges and significant historic sites.
Section 106 of the National Historic Preservation Act, as amended	Protection of districts, sites, buildings, structures, and objects significant in American architecture, archaeology and culture.
Uniform Relocation Assistance and Real Property Acquisition Act, 1970, as amended in 1987	To ensure property owners and persons displaced by highway projects are treated fairly, consistently and equitably.
Title VI of the Civil Rights Act, 1964 and Americans with Disabilities Act	Ensures that no person shall on the grounds of race, color, national origin, age, sex, or disability is subject to discrimination under any program or activity receiving federal assistance.
Executive Order 12898, Environmental Justice	Avoids Federal actions, which cause disproportionately high and adverse impacts on minority and low income populations.
Executive Order 11990, Protection of Wetlands	Avoiding direct or indirect support of construction in wetlands where there is a practicable alternative.
Executive Order 11988, Floodplain Management	Ensures evaluations of impacts of encroachments of floodplains.
Endangered Species Act of 1973, as amended	Protects species of fish, wildlife and plants facing extinction.
Rivers and Harbors Act, 1899	Protection of navigable waters in the US. Section 9 of this Act establishes Coast Guard permit authority for bridges and causeways across any navigable waters. Section 10 establishes USACE authority to issue permits for obstructions or alterations of navigable waters of the US.
Farmland Protection Policy Act, 1981	Minimize impacts on farmland.
Michigan Public Act 116, Farmland and Open Space Preservation Act, as amended	Protects farmland where the landowner has agreed to keep the land in agricultural use.
Michigan Public Act 451, Natural Resources and Environmental Protection Act	Consolidates other state laws relating to the environment and natural resources.

Clean Water Act, 1977 & 1987	Regulates discharges of pollutants into waters of the United States. Section 404 of this Act requires permits for dredging and filling waters of the United States.
Resource Conservation and Recovery Act, 1976 as amended	Provides for the recovery, recycling, and environmentally-safe disposal of solid wastes.
CERCLA Act, 1980	Provides for liability, compensation, cleanup and emergency response for hazardous substances released into the environment and cleanup of waste sites.
Clean Air Act, as amended	Insures transportation plans, programs and projects conform to the state's air quality implementation plans.
23 CFR 771, 1987 and 1991	FHWA/FTA Regulations on the preparation of Environmental Impact Statements and Related Documents. Also regulations on the application of Section 4(F) of the DOT Act.
FHWA Technical Advisory T6640.8A, 1987	FHWA guidance on the writing and distribution of Environmental Documents.
23 CFR 772	FHWA procedures for abatement of highway traffic noise and construction noise.





*Providing the highest quality integrated transportation services  
for economic benefit and improved quality of life*

